

Macrophytes: Accounting for the Unaccounted

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What are macrophytes?

Rooted, sometimes free-floating, aquatic flowering plants.



Applicable Standards

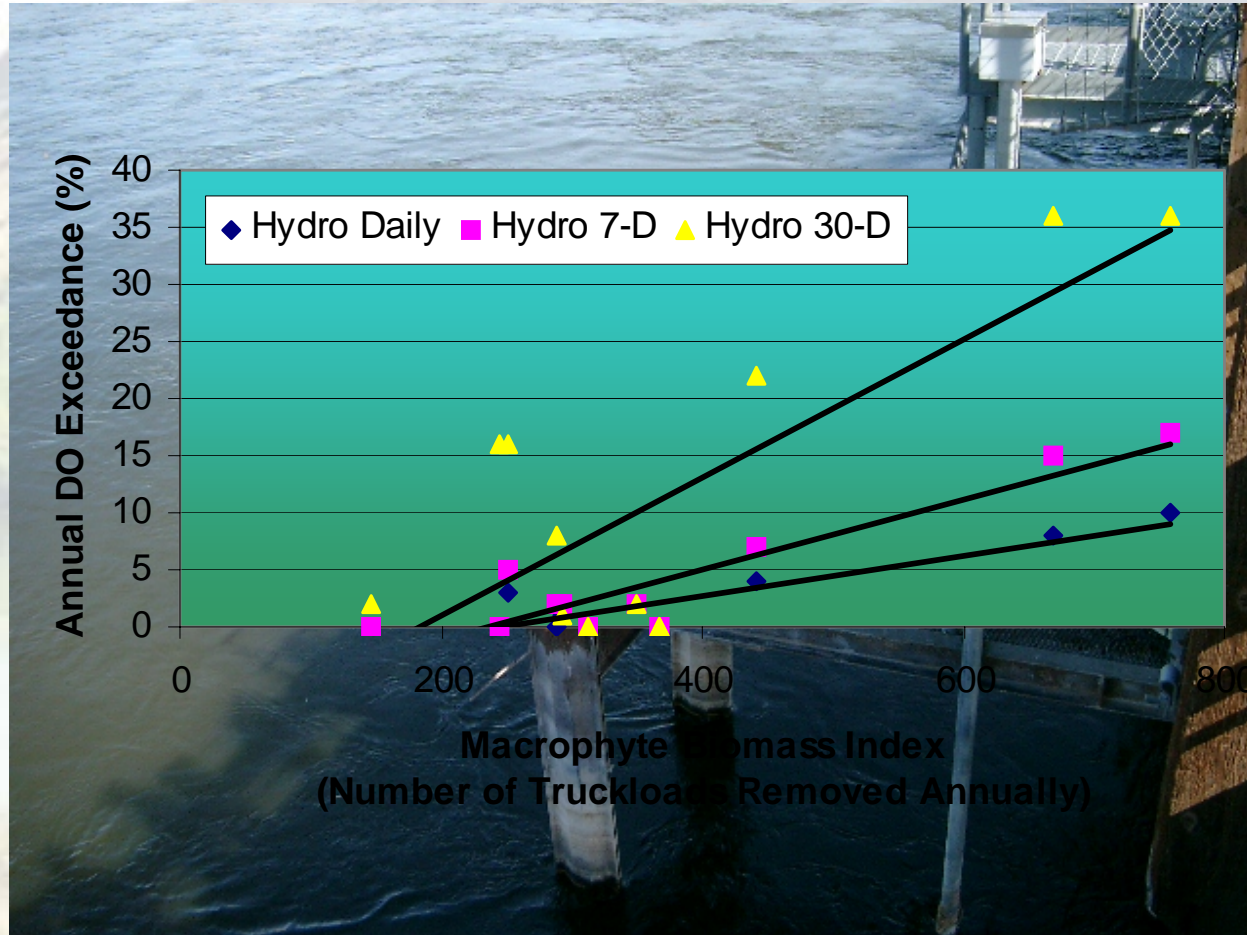
Free from floating, suspended, or submerged matter of any kind causing nuisance or objectionable conditions that may impair beneficial uses.

Free from oxygen-demanding materials that would result in an anaerobic water condition.

Overview

- Macrophytes in the Snake River are not only a nuisance or objectionable, but also are a source of oxygen-demanding material
- Macrophytes are not collected in most water samples
- Macrophytes have not been accounted for in many total maximum daily loads
- Macrophytes contribute to a measurable effect in water quality

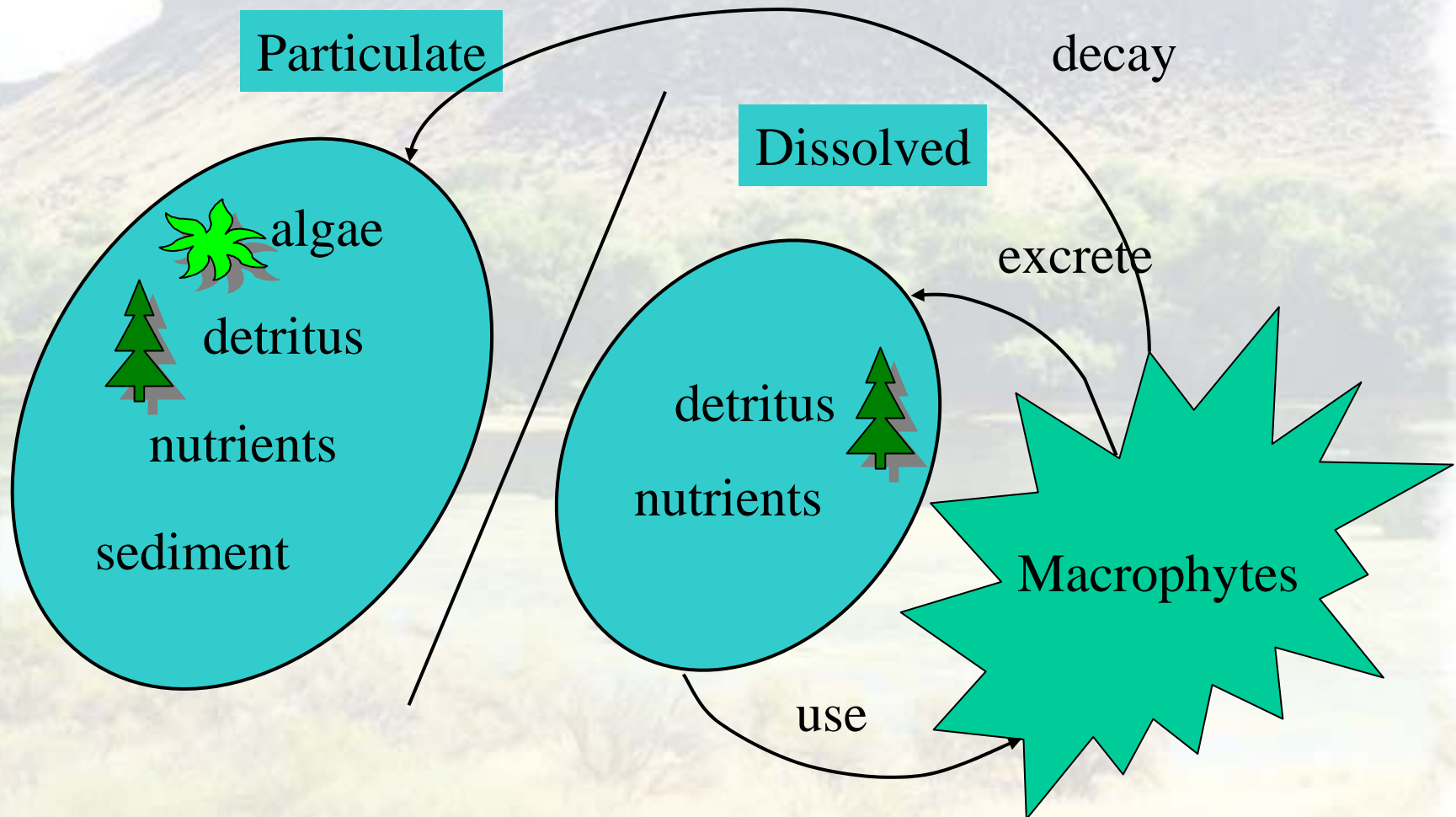
Do Macrophytes Affect Water Quality?



Common Sampling Method



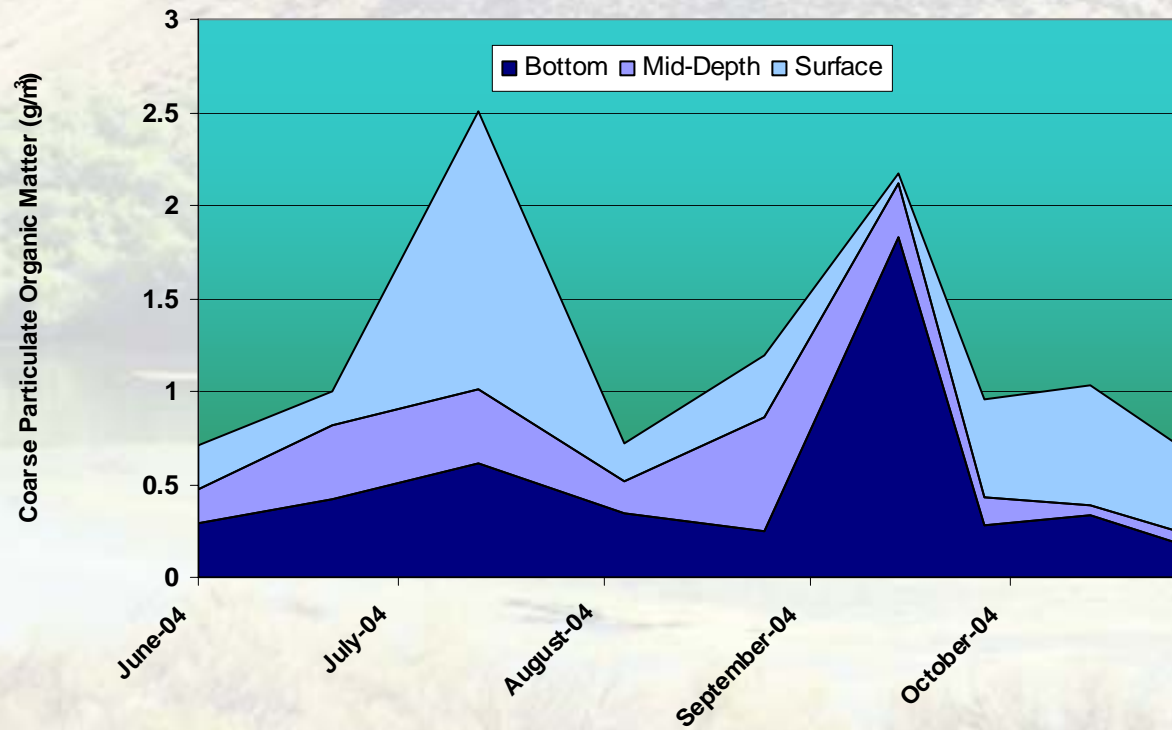
Water Sample Partitioning



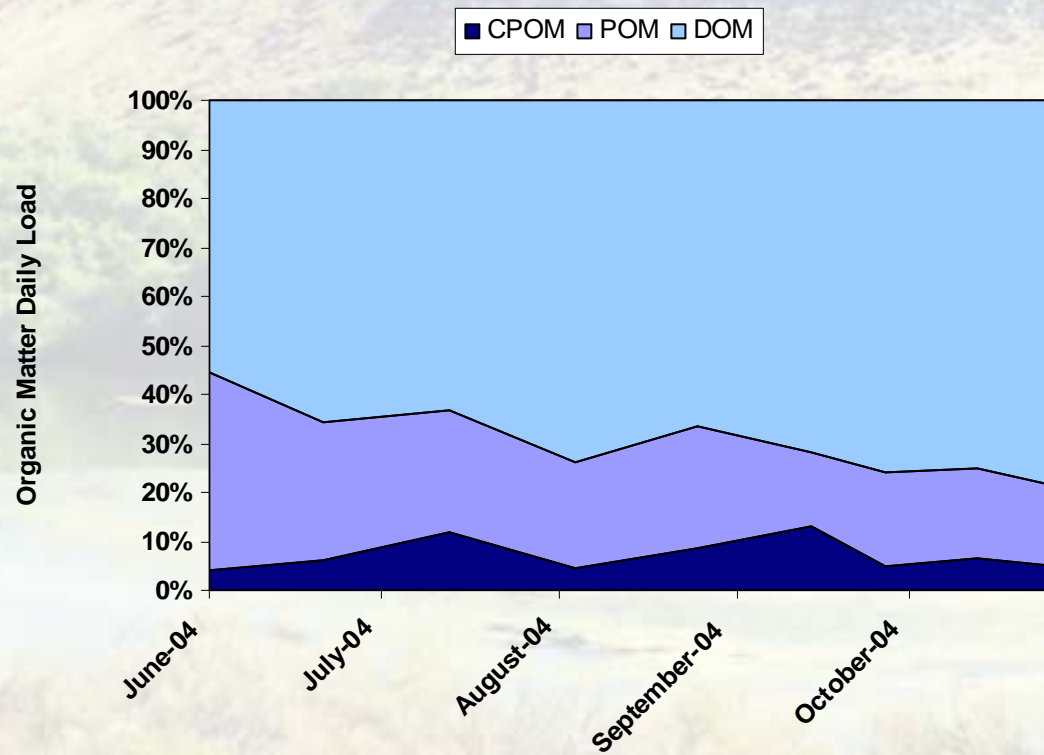
Macrophyte Sampling Method



Were we successful?



Organic Matter Daily Load

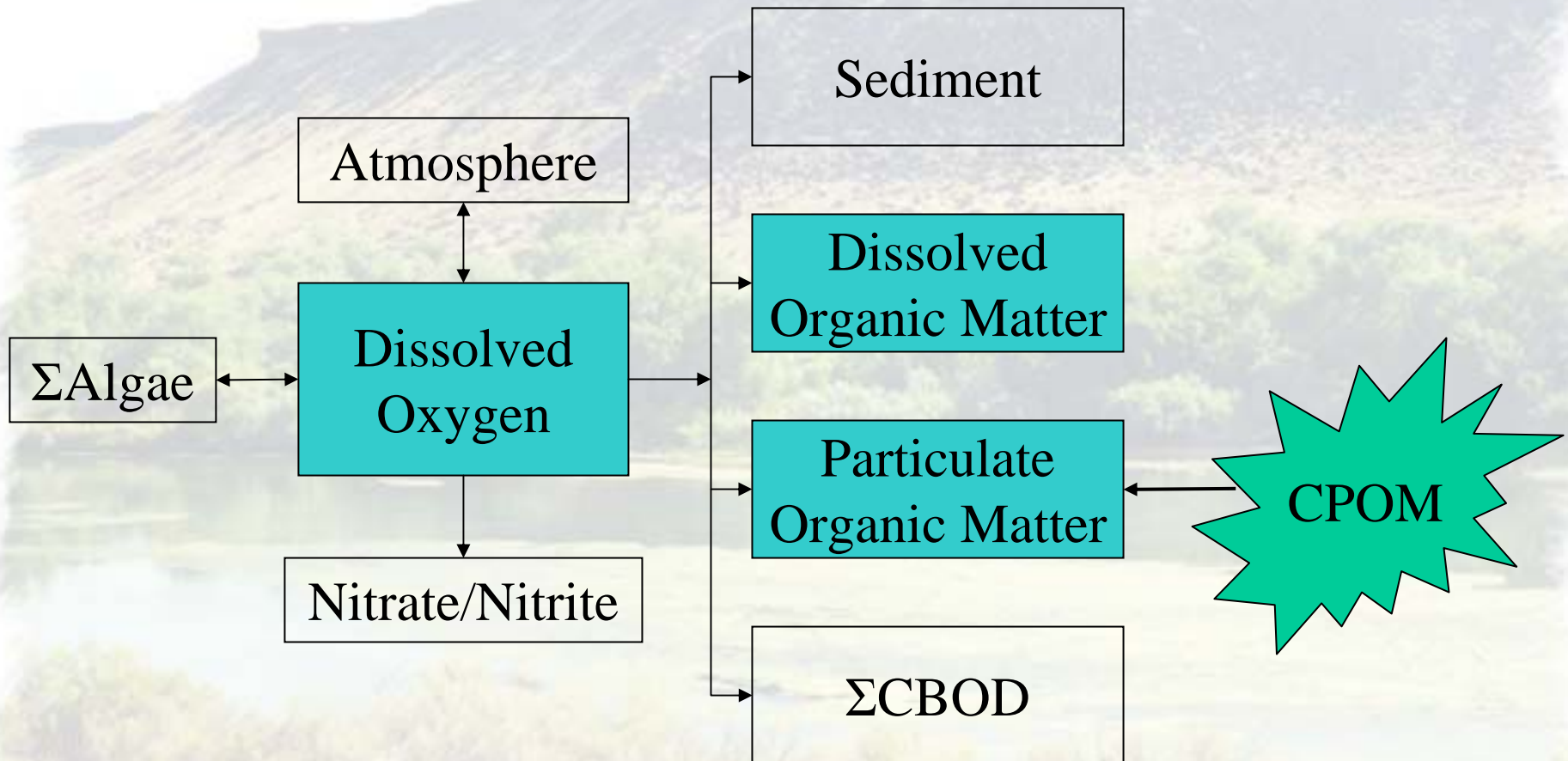


Total Maximum Daily Load

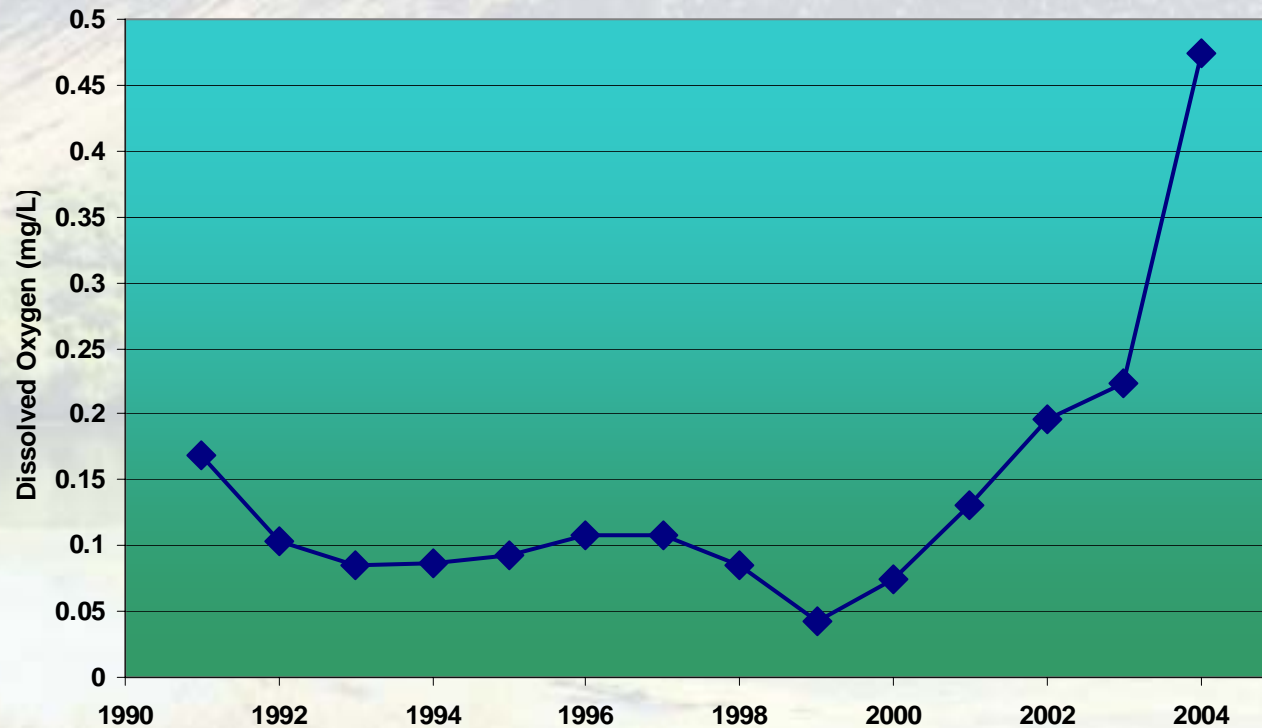
~~King of the Spades, the King of the Clubs, the King of the Diamonds, the King of the Hearts (DEHOFAOPEB) 4)~~

- Research for Multiple Snake Rock TMDL and Snake River Hells Canyon TMDL
- Water column data, to predict water quality data, to predict macrophyte biomass
- Macrophyte biomass
- Research for the different morphological biomass and total conditions, but not so for temperature and macrophyte biomass
- Macrophyte biomass in Brownlee
- Macrophyte biomass in C.J. Strike
- Research in macrophyte boundary condition data

CE-QUAL-W2 Processes



Macrophyte Oxygen Demand



Conclusions

- Macrophytes affect water quality
- Current sampling methodology does not collect macrophytes and, therefore, does not directly account for macrophytes during analysis
- New sampling technique does collect macrophytes allowing direct accounting

Conclusions (continued)

- Macrophytes accounted for 4-13% of the daily organic matter load in the Snake River inflow to C.J. Strike Reservoir during the summer 2004
- Macrophyte organic matter in the Snake River inflow to C.J. Strike Reservoir consumes on average about 0.15 mg/L dissolved oxygen when it decays
- This equals about 750 tons of dissolved oxygen per year